

Sizzling Ice Volcanoes

Summer is the perfect time for some frosty science fun. Keep your students cool while exploring solubility, changes in state, emulsions and fizzy, foamy and frothy chemical reactions.

There is plenty of science to explore while enjoying this frosty fun. You can investigate the effect of temperature on solubility, changes in state, as well as chemical reactions which produce a gas.

You will need: Disposable cup, sandwich bag, golf ball, baking soda, food colouring, vinegar, and water.



What to do:

1. Place the golf ball in the bottom of an empty plastic cup.
2. Open up a plastic sandwich bag and use it to line the inside of the cup. The golf ball will be trapped between the bottom of the cup and the sandwich bag.
3. Dissolve enough baking soda in the water to create a saturated solution. You can tell the solution is saturated when no more baking soda will dissolve. Use food colouring to tint the baking soda solution.
4. Carefully pour the baking soda into the sandwich bag so that the top of the golf ball is below the surface of the water.
5. Put the cup into the freezer and freeze until the water is solid.
6. Lift the plastic bag out of the cup and carefully remove it from your frozen baking soda solution. The golf ball will have created a crater in your lump of ice.
7. Flip the frozen volcano over so that the crater is pointing up.
8. Take the volcano outside or place it in a basin and fill the crater with pickling (or regular) vinegar.

What's happening?

Students should notice that the solution is clear when it goes into the freezer and cloudy when it comes out. Solubility is temperature dependent so some baking soda should precipitate from the solution as the temperature of the water decreases. When vinegar is added to the well, it will begin to react with the baking soda to produce water, a salt called sodium acetate, and carbon dioxide. The carbon dioxide will begin to bubble out of solution, causing some foaming. The reaction may be quite slow at the beginning because chemical reactions are temperature dependent. For a more vigorous reaction, add baking soda to the crater before pouring in the vinegar.